THE OPTICAL MAGIC LANTERN JOURNAL AND PHOTOGRAPHIC ENLARGER.

EDITED BY J. HAY TAYLOR.

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Notices.

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Notes.

According to Tesla, the light of the future will be that electric light which, without any direct communication of current, but simply through the direct radiation of electricity, will become operative by the mere bringing of the light-giving body into a room filled with electricity.

* * *

Mr. H. J. Riley, one of the partners of Riley Bros., of Bradford, has now settled down at the headquarters lately opened by this energetic firm, at 16, Beekman-street, New York, U.S.A. Agencies have been established in the chief centres and these have been stocked with lantern apparatus and slides. A special feature is to be made of the hiring of slides.

* * *

From the 8th to the 22nd September an International Photographic Exhibition will be held at Amsterdam. As a number of titled people and persons of influence are lending their support, it is anticipated that it will be a brilliant success. Rules, regulations, and entry forms may be obtained from the Hon. Secretary, 2, Handboogstrat, Amsterdam.

* * *

It is stated that Prof. Scripture, of the Yale Psychological Laboratory, U.S.A., has discovered a new method by which he can project lantern slides on a screen with stereoscopic effect, so that all in the audience can see same without using any aids to vision, he doing everything that is requisite at the lantern itself. The professor refuses at present to divulge the secret as to how it is all done. Tall stories sometimes come from across the ocean.

The Photographic Salon will be held at the Dudley Gallery, Piccadilly, from September 30th to November 2nd. The usual charge of one shilling will be made to the public.

* * *

On page 108 of our number for June, in a letter from Mr. Jex Bardwell, in which he spoke of offering his services at the United States Photographic Convention, we headed it "Convention at Montreal," instead of "Convention at Detroit." Mr. Bardwell's address is 93, Cass Street, Detroit, Mich., U.S.A.

* * *

The annual exhibition of the Royal Photographic Society will be opened at the gallery of the Royal Society of Painters in Water Colours, Pall Mall, on September 30th. The secretary at 12, Hanover Square, W., will supply all information that may be required.

* * *

At the late tobacco exhibition at the Agricultural hall, Mr. W. D. Welford organised a photographic department, and did it well too, he having got together an excellent collection of pictures from various parts of the world.

* * *

On page XV. will be found a statement from the Autotype Co., in reply to the letter in our last with reference to the firm of Messrs. Elliott & Son, of Barnet.

—:o:—

Principle of Condensers, Spherical Aberration, etc.

STAGE ILLUMINATION.

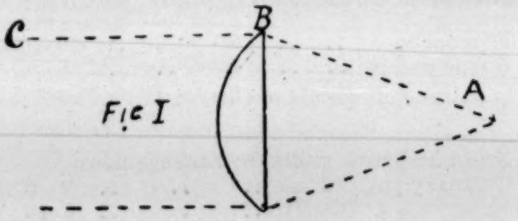
A correspondent writes:—"I have been endeavouring to throw an ordinary limelight through coloured glass on to a small tableau, but I have not succeeded in getting the proper condenser. The difficulty seems to be the very short distance between the apparatus and the object to be lighted—only some nine or ten feet—whilst the area that has to be covered is some seven feet at the least. Can you assist me as to how to do it?"

This is a subject dealing with the manner in which rays of light falling on a condenser leave the same after passing through it, and, when the details are grasped by the reader, no difficulty should be in the way of gaining the desired illumination on any surface.

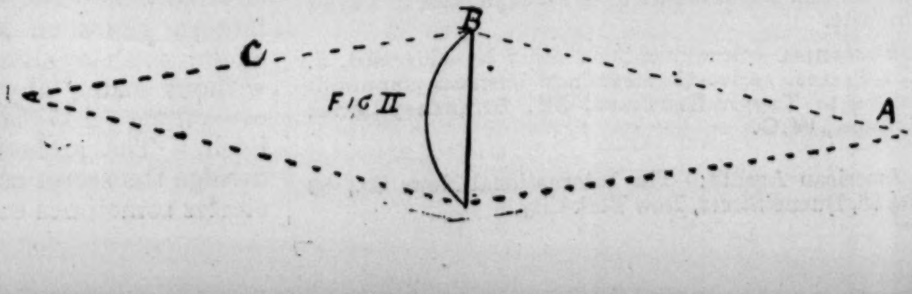
For stage illumination, a single condenser, with what is known in the trade as a ghost-box, is employed. Given any particular plano-convex lens, which is termed a condenser, the focus of same may be ascertained by measuring at what distance from the lens parallel rays (approximately) come to a point. This may be determined by holding it convex side outwards towards, say, a window, on the wall of the room opposite which a piece of note paper has been affixed. In front of this, the lens is moved to and fro, until the image is as sharply depicted as possible under the circumstances. The measurement from the paper to the lens will give the focus.

Supposing we start with a lens of the style mentioned, which is six inches in diameter with a focus of eight inches, this being a commercial size; after fastening it in a board or box for the purpose, with a circular opening, we shall find that if we place the illuminant at a distance of eight inches from the lens (which must have its flat side next the illuminant) the projected rays will be practically parallel, and that if the light be brought further away the projected rays will come to a point, more or less, at some particular distance bearing a relation to that from which the light is distant from the condenser. The points of the source of light and that at which the projected rays meet are termed the conjugate foci.

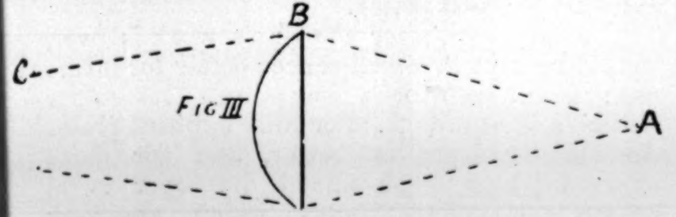
To make the meaning clearer, the following diagrams will assist. In Fig. I. the light A is placed at the focus of the lens, and it will be seen that the light is projected in a parallel manner.



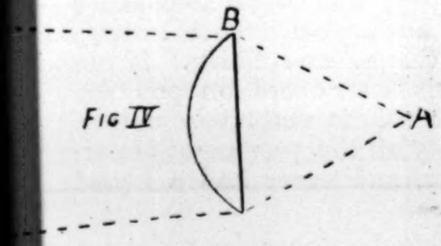
In Fig. II. it is placed sixteen inches off, and the projected rays come to a point about the same distance in front of the lens.

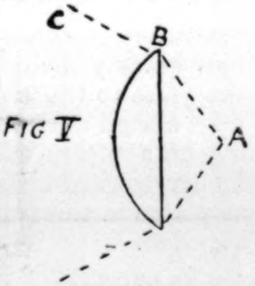


In Fig. III. the light is represented at twelve inches away, which elongates the anterior conjugate focus of the projected rays.



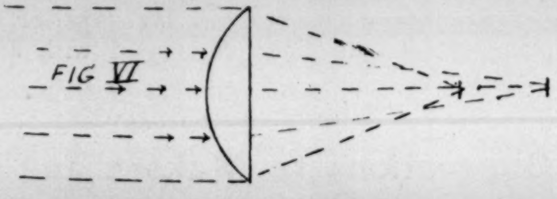
When the illuminant is brought closer to the lens than its solar focus, the rays, after passing through the lens, no longer meet, but are spread apart, as shown in Figs. IV. and V.

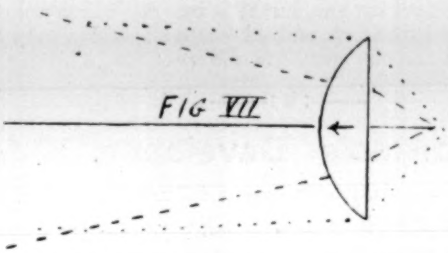


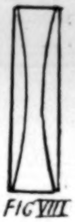


It will be observed that in every case the angle A B C is the same, so that it may appear a simple matter to calculate at what distance the illuminant should be placed from the lens, in order to project the desired size of disc on the object to be illuminated.

But now another factor has to be considered. All single lenses give what is known as spherical aberration, that is to say, rays falling at the sides of a spherical lens are not bent or refracted at the same angle as those falling more toward the central portion of the lens; the more the curvature, or in other words the shorter the focus of the lens, the greater is the spherical aberration. Fig. VI. explains this with regard to parallel rays falling upon the lens, and shows about where the various rays come to a focus, whereas Fig. VII. will give an idea as to the direction of the rays from a given point. It will thus be apparent that in order to illuminate the stated surface at the distance required by our correspondent, a lens of very large diameter would be requisite by reason of the outer sides being rendered ineffective owing to the rays from them bending towards those emanating from the more central portions of the condenser. How then, it may be asked, can this difficulty be overcome? The reply is, by using a condenser composed of two lenses, so that when mounted together as in Fig. VIII., they possess the same focus as that composed of the one spherical condenser. This too will possess spherical aberration, but in a much less degree than the former; and in order to make due allowance, a condenser to do the work mentioned at the beginning of this article will require to be one of about six inches in diameter and eight or nine inches combined focus. A still simpler method would be to use an ordinary magic lantern with an objective of four or four-and-a-half inch focus, this would cover the desired space; but the simplest plan of all would be to use the naked limelight behind a plate of tin in which a hole has been cut, and adjust the distance of the light behind it until the desired spread of illumination is obtained.







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Art in relation to Lantern Slides.

By ———

Now is the time of year when one can saunter down the country lanes with his tripod over his shoulder, admiring the beauties of Nature. Casting his eye to the right of him, he can behold the dim steeple in the distance, bathed in that atmospheric effect so much admired of late, whilst on his left he beholds the rural windmill, the arms of which rotate according to the dictates of the wind. Being thus placed, he naturally thinks of the fine effect to be obtained in a negative of the surroundings. Going still further along the road, he sees the wayside ponds which contain life in a multitude of forms, the contemplation of which recalls many a . . . .

The above is a fair sample of twenty pages of an

article received from a contributor. We print it, not for the information that it will afford readers, but as a sample of the style of article that we do *not* want. What we want are articles of a practical nature, but we regret to say that after reading the twenty pages aforesaid we find that they contain nothing but a flow of rhetoric, and we fail to see that our readers will be one bit the wiser had we published the remainder. Art, no doubt, is a subject capable of good treatment, but it is one on which many words can be expended, and too often the result may be summed up in the one word—twaddle.—[ED.]

——:o:——

Moreno's Developer.

THE question as to the best developer for gelatine dry plates has been discussed time and again, says Mr. Berthold Blauert in the *Photo Times*, and is still an open one. Oxalate of iron is undoubtedly a very good developer, and for bromide paper it is unsurpassed; but it requires particular care in manipulation, and more for this than for any other reason it has been pushed aside by pyrogallic acid. Then came hydro-chinon, paramidophenol, eikonogen, rodinal, metol, glycin, and a score of combinations of them. But, nevertheless, pyro holds its own to-day, and many photographers after having been led astray by the new group of developers return to pyro. How many pyro developer formulæ exist I do not know, but I have tried a great number of them. The last that I tried was the one published some time ago by Mr. A. Moreno, the well-known photographer of New York, and in my opinion it is the very best developer, and I think that in future I shall never work with another formula.

Here it is:

I. Saturated solution of carbonate of soda.
II. Saturated solution of sulphite of soda.
III. Take of solution II. any quantity, say four ounces, in a glass, and add to it dry pyrogallic acid (Merck's preferred) as long as it will easily dissolve by shaking, and keep this in a well-corked bottle.

For developing take of solution I., three ounces; of solution II., six ounces; of solution III., two drachms.

This will make a good developer for Seed or Eagle plates; other plates require more pyro (solution III.) up to four drachms for American plates. More sulphite (solution II.) gives a more bluish-grey tone to the negative.

This quantity will be sufficient to develop about one dozen 5×7 plates.

Then it would be advisable to make up a fresh amount as stated before, and add of the old developer enough to make sixteen ounces, as in this proportion it will work better for correctly exposed plates.

The developer, after the day's work is over, should be kept in a well-corked bottle for future use; it will keep for a long time. Its colour will be a light orange. For fully exposed plates the old developer is better, and for short exposed plates fresh mixed developer is of course preferable. Plates which are very considerably over or under-exposed are better thrown into the waste barrel.

Slightly under-exposed plates I take out of the developer and flow over with some of solution I. (carbonate of soda), and repeat this operation if necessary, and it is astonishing how quickly the details appear. Then I return the plate to the developer and finish. It has been stated that this latter operation produces fog on a plate, but this is absolutely untrue. I have worked nearly all the prominent brands of plates in this way, and never had a fogged negative.

The success of this developer depends upon whether the stock solutions I. and II. are well saturated. There must always be undissolved crystals of carbonate of soda and sulphite of soda in their respective bottles.

Negatives thus developed are very soft, rich, full of details, and of excellent printing quality.

As this developer is very heavy in its solution it flows over the plate like oil, air bubbles are never formed, and it does not stain the fingers any more than eikonogen.

Any photographer who will give this developer a fair trial will surely like it, for it is simplicity itself. There is no weighing or measuring in making up stock solutions. In fact, Mr. Moreno never measures the proportions in making up developer.

The resulting negatives are far superior in printing quality to those developed with any other formula.

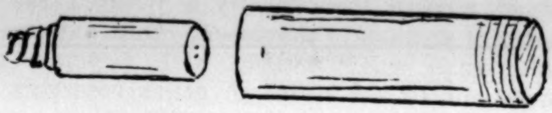
——:o:——

Suggestions to Makers and Dealers.

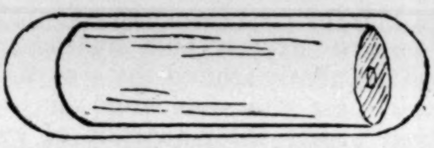
IN these days of keen competition some dealers find it not an easy task to keep their customers, even when they have got them, and without doubt those who are continually adding small novelties, or what may almost be termed nick-nacks, to their stock, have a decided advantage over those who do not.

The following are a few articles which are, we think, worthy of consideration :—

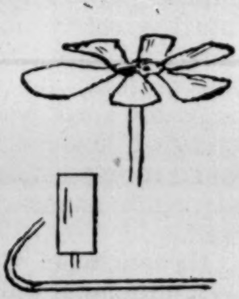
Who has not seen the burners of a star gas chandelier blocked up with soap and other substances so as to prevent the escape of gas when using one of the burners to obtain a supply of house gas for use with a blow-through jet, and after the entertainment was over seen someone struggling with a pin trying to clear the burner? Why not then put up half-a-dozen of the rubber tubes, with a plug at one end, as shown, so that lanternists may have some at hand to slip over any burners when necessary.



The usual method of packing limes in tins which have a small rim round the top, in many cases causes two or three limes to be broken before one or more can be removed, to say nothing about the dirt caused by the lime dust in which they are packed. Bottles and metal tubes have been used, but oft times they are not again fastened up securely, and the result is that the moisture in the atmosphere soon renders the remaining limes useless. How much better it would be if they were put up singly in thin glass tubes and hermetically sealed after the manner of tubes of chlorate of gold.

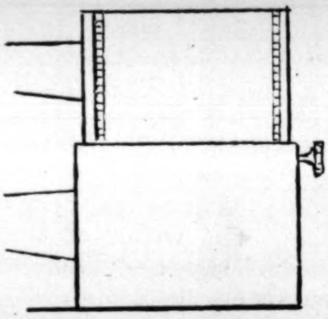


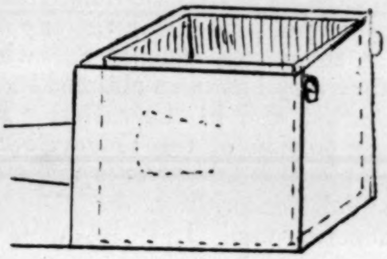
Many no doubt have seen the tin fan that is sold about the streets for attaching to the top of the chimney of a domestic oil lamp, and which goes twirling round by the ascending heat from the flame. It would not be a difficult matter to arrange this principle for turning the limes very slowly. With an arrangement of this sort the operator would be relieved of the necessity of turning his lime. This could likewise be done as in the olden days by spring and clock work, but why not make the ascending heat the motive power?



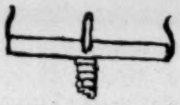
A plug to screw into the valve of a gas cylinder is a handy thing to keep out dust and dirt, and many are in use, but when one wants anything of the kind he must get it made to order. How much better if he could go to any dealer in lantern apparatus and get one at once for a few pence.

Several persons with whom we have come in contact say that they use a single instead of a bi-unial lantern because of the bulk of the latter. There is no reason why a bi-unial should not be made telescopic, so that when closed it will appear as though it were a single lantern. This can be very simply done, as will be seen from the rough sketch herewith. On both sides of the upper lantern are racks and pinions, as at A B and C. When about to pack up, the front (D) of the upper lantern is removed and inserted inside, and the lantern telescoped by turning the knobs (C).





It is generally acknowledged that the pin upon which a lime is set is often the cause of its splitting. It is an easy matter to unscrew the pin with its base or table, and insert in same screw a base containing three small spring clips, after the principle of supporting the chimney of a domestic paraffin lamp, but where can such a thing be obtained unless one gets it made to order? Surely this is worth the attention of dealers.



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Within a few days a new Lantern Catalogue of 350 pages will be issued by Messrs. Joseph Levi & Co., of Furnival Street, E.C., and will shortly be in the hands of all dealers. It will contain full particulars of Allen's Patent Automatic Lantern which we described on page 96 of The Optical Magic Lantern Journal for June.

The Birth of the Limelight.—
No. III.

By W. H. Harrison.

Before taking leave of Dr Clarke, it may be as well to say that since my last article was written, I have found that he did not get off altogether free in his own time, in appropriating the invention of the oxy-hydrogen blowpipe to himself, although his claims were then swallowed by many. "The New American Cyclopædia," Appleton & Co., New York, 1859, sets forth how Dr Turner - I presume the chemist—justly gave the whole credit of the invention to Dr Hare, and stated also that the apparatus which Clarke used was the contrivance of Mr. Newman. The writer of the article in the "Encyclopædia" says :—"Though his (Clarke's) experiments were successful, and were a subject of great scientific interest, the apparatus proved too dangerous for use, the wire gauze not preventing the explosion of the gases. On these experiments the whole merit of the discovery has been claimed in England for Dr. Clarke, and in the article 'Blowpipe' in the last edition of the 'Encyclopædia Britannica,' no mention whatever is made of Dr Hare's, but a full description is given of Dr. Clarke's experiments." In "Brande's Chemistry," the most useful work of its class of its time, all credit is given to Dr. Clarke for the invention of the oxy-hydrogen blowpipe, and no mention is made of Hare; in fact, Clarke was for the time successful in ousting Hare from his proper position in this matter, in the estimation of probably the majority of people in this country, but in the long run justice is usually done in such cases.

The idea of safety jets was born with the oxy-hydrogen blowpipe, and after Newman's and one or two others died out, a celebrated safety jet arose which had a long lease of life. The capillary tube used by Clarke was founded upon the discovery of Sir Humphrey Davy, when devising his miners' safety lamp, that flame will not pass through an orifice so small, that in its passage the flame gets cooled to a temperature at which it cannot exist. Hemming's jet, which many of us can now remember very well, consisted virtually of a cluster of a large number of such tubes, formed by the interstices between fine longitudinal wires.

Mr. J. Hemming lived at 5, Brecknock Crescent, Camden Town, London, he bought his safety jet under the notice of the Society of Arts, in a letter dated April 11th, 1832, and published in the "Transactions of the Society of Arts" for 1833, volume XLIX. In it he set forth that the jet he sent to the society for inspection consisted of a brass cylinder of about three-quarters of an inch internal diameter and four inches long, filled with equal lengths of brass wire $\frac{1}{120}$ inch in diameter. The number of wires in the tube was 4,200, and they were wedged closely together by a pointed rod a quarter of an inch in diameter. One extremity of the tube was provided with a screw for attachment to a bladder or other reservoir of the mixed gases and the other with a blowpipe jet of the usual kind. The interstices between the fine wires, which are extremely small, become in effect a congeries of metallic tubes of the smallest possible bore, the cooling and conducting power of which are far greater than could be effected by filling a tube of equal length with the usual contrivance at that time, namely, discs of wire guaze. The apertures between the wires were much smaller than those in the finest wire guaze, and possessed the decided advantage of uninterrupted continuity.

Mr. Hemming also stated that in a great number of experiments with this safety tube, he had never been able to produce a recession of the flame of mixed oxygen and hydrogen, although he had frequently ignited them at the extremity of the wires after removing the jet piece, which was nearly three-quarters of an inch in diameter, and he had taken off all pressure repeatedly. He was so convinced of the safety of the jet that he operated constantly with the mixed gases contained in a bladder held under his arm, even when the jet piece was removed. He said that in the course of his experiments with Gurney's blowpipe, provided with Wilkinson's safety chamber, he found that he could produce explosion of the gases in the well, many times in succession, if even a very minute portion of water passed with the gases into the safety chamber. By filling the well nearly full of water, without a stratum of oil on the surface, he could always produce an explosion; but when his own safety tube was attached instead of the usual chamber, he found it impossible in any instance and under any circumstances to explode the gases in the well.

He concluded with what may now be regarded as a prophetic warning, bearing relation to the future of the Hemming's safety jet:—"It may be necessary to observe, it is indispensable that the wires in the tube be as fine as those I have employed. If thicker wire is used, the interstices are larger, and, consequently, there is a chance of the flame receding through them. The wires should also be as closely wedged together as they are in the accompanying instrument, in order to ensure minuteness of aperture." This letter was accompanied by drawings, which were engraved in the "Transactions of the Society."

Mr. Hemming afterwards attended and performed before a committee of the Society of Arts all the experiments described in his letter, to the "entire satisfaction" of his critics, and the Society afterwards awarded him a large silver medal for his "Safe Tube for the Oxy-hydrogen Blowpipe." Hemming's safety jet, as we all know, had a large run of popularity, but at last fell into disfavour. Had they all been made exactly like those of the inventor, and his warning at the end of his communication been attended to, it is hard to see that flame could ever pass through them; but when an invention gets down into the commercial world, and apparatus is sometimes made by men who do not understand its principle, or do not bestow the care upon the work which it would have received at the hands of the original inventor, things are apt to go wrong. The Hemming's jet gradually changed its external appearance; in some instances it grew longer and its diameter grew smaller. It necessarily, as he made it, put much friction in the path of the gases.

Thus far have we followed the invention of the oxy-hydrogen blowpipe, and the invention of the earliest safety jet of any importance; we have now to come to the actual birth of the lime-light for illuminating purposes by the application of the oxy-hydrogen flame to the rendering of lime incandescent.

—:o:—

On the Selection of Subjects for Lantern Slides.

By D. Moore.

No greater fallacy exists than to think that because a picture looks well when of small dimensions it will retain its artistic appearance when enlarged to many hundred times its original size on a large lantern screen. The laws of composition are more exacting when applied to large work than on the diminutive 3¼ × 3¼ lantern slide. Many compositions on a small scale are tolerably satisfactory until they are increased in size, when first one improvement and then another suggests itself until we find our original has to be very considerably modified to pass muster as a picture. Now, as any alteration of a photograph must take place at the beginning, that is when it is taken, it goes without saying that special care must be exercised in selection and grouping if we wish to secure satisfactory work—certainly much more than is usually accorded it.

There is no doubt that lantern exhibitions, although yet popular, have not the interest they used to have; an interest that seems slowly dying out which I fancy may be in some way attributed to the monotony of the exhibitions and the large numbers of insipid subjects of a level mediocre quality that are shown. The manipulations required for lantern slide making are now so well known and carried out that the mere technical excellence is quite insufficient to attract on its own account. Effective pictures in both lighting and treatment are absolutely necessary, and the appreciation of anything of the kind in an ordinary lantern show is so pronounced that it leaves no shadow of doubt. Exhibitions of this kind to be successful must be made so by the selection of suitable transparencies made from suitable negatives.

It is very difficult, without having seen how a small picture is metamorphosed by enlargement, to appreciate the astounding alterations that increase in size alone makes, portions that were subsidiary or scarcely noticeable on the small scale will become invested with importance sufficient to make or mar all the rest of the picture.

An ugly, inartistic pose or form of animate or inanimate nature may remain unnoticed on the small negative, to blossom out into an absurdity on the screen, if not to become actually offensive. To avoid such contretemps the subject had better be judged from its impression on the eye rather than on the focussing screen, which is contrary to accepted method in taking pictures intended to remain the same size. I do not mean that the focussing screen should be discarded, but that the general effect should be decided upon by the judgment of the eye unassisted rather than almost entirely relying on the reduced form shown on the camera screen afterwards. I am inclined to think that one reason for insipidity of many lantern entertainments is in a great measure owing to the unsuitableness for enlargement of the pictures shown, which although looking exceedingly nice out of the lantern, will not bear the augmentation in size to which they are necessarily subjected.

It is, of course, quite possible to make excellent lantern slides from negatives not originally taken for the purpose, but much more discrimination is required in making a proper selection than actually obtains. Providing such negatives are much larger than the size of the orthodox slide, but suitably and artistically composed for the size they were taken, it rarely happens that a slice out of them will conform to the requirements of picture making. Such negatives must be copied in the camera in their entirety, or at any rate with very little trimming, and then on the whole give very satisfactory results.

The foreground is generally the weakest place in an enlargement; more often than not there is too much of it, especially if it is a plain uninteresting one. A good group of foliage, especially of the Dock species, will of itself make an interesting foreground, especially if interspersed with rough stones to vary the lines. Studies of handsome foliaged wild plants if taken with a judicious play of light and shade, will of themselves form excellent lantern subjects, and in this connection I would advocate a careful and intelligent examination of our lanes and woodlands, as calculated to provide most interesting and beautiful pictures, if (and I say this advisedly) they are not shown on a scale larger than nature. Nothing is more offensive to good taste than to see flowers and leaves many times larger than it is possible for them to grow.

These subjects commend themselves for small screens; a four feet screen being ample to show them off to the best advantage. The only occasions when the enlargement of botanical subjects is appropriate, is when shown to exhibit their formation, either sectionally or otherwise, for educational purposes. They are then removed from the category of pictures to that of diagrams, and abnormal increase of size is sooner to be recommended than otherwise, so that their structure is made distinct as possible.

In contact printing from larger negatives there is a difficulty in preserving a correct ærial perspective in the projected image; very often a distance and mid-distance (the negatives being harmonious and full of atmosphere) is chosen, with no portion of the foreground as originally existing. The enlargement of this portion separated from its original foreground now depends for its picturesque effect on a new foreground, composed from a distant part with a result of unnatural flatness, for in almost all photographs after a certain distance one plane cannot be distinguished from another, but merge into each other in a level greyness, form and size only conveying the idea of space.

The selection of negatives rather deficient in atmosphere are best for such partial reductions, as a lantern slide must be considered apart from any other kind of photograph as merely a means to a special end. It is for this reason the best plan to take negatives especially for lantern work—at any rate negatives not exceeding ½-plate size but ¼-plates are to be preferred, either permitting an amount of selection that is denied to a lantern size plate direct.

Most landscapes are improved by the introduction of suitable figures in good positions, not only as regards themselves individually, but with reference to the composition of the picture generally they form a valuable aid to proper harmonising of lights and shadows. If we examine the paintings of Cuyp, nearly all have dark and light figures—horses, cattle, dogs, men and women arranged so that some are light against a dark background and some dark against a light background, so that they form a connecting link between the light and shade. Portions of figures in the immediate foregound never look well, and entire figures seem exaggerated and out of place. So, unless sufficiently distant to be subservient to the subject, they are better omitted; but, provided they occupy an important position, the utmost care should be bestowed on their pose and arrangement, as figures of any importance always challenge attention and criticism before the rest of the subject, and this being so they should be without reproach. Animals seldom appear awkward whatever pose they assume, but there are some positions very much better than others that should be secured if possible. Dark animals against light ones and not several light together or dark together, an arrangement that produces a confusion of effect, especially if any little movement has taken place, which makes the confusion worse confounded, and would be avoided by properly contrasting the colours or rather the lights and shades.

As a rule pictures whose chief attraction depend on their foregrounds make the most effective lantern slides and pictures, with brilliant cloud effects are almost equally so, but a wide expanse of country, a view from a high hill say, comes out very tame on the screen—it may be of local interest, but not as a picture. Brilliancy and contrast are absolutely necessary to successful lantern slides.

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New Apparatus.

THE POCKET KODAK.

The latest introduction by the Eastman Photographic Materials Company, Limited, is a Kodak on a miniature scale which they term the Pocket Kodak. Although it is very small, being only 2¼ by 2⅞ by 3⅞ inches, it is in all respects a perfect camera, and takes a negative 2 by 1½ inches, the reproduction as in Fig. I. being from one of the negatives. The camera carries in spool-form sufficient for twelve exposures, and when this is finished, the spool may, in daylight, be removed and a new one inserted.

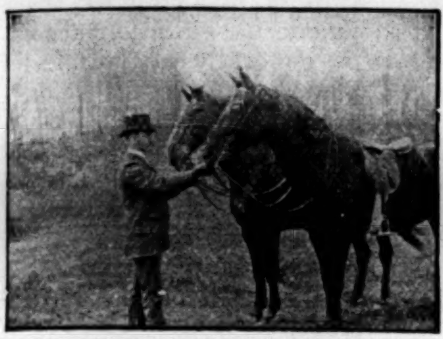


Fig. I.

Supposing it necessary to insert a new spool of film, which can be obtained put up in readiness for inserting in place, we must first get to the inside of the camera; this is done by inserting the finger nail in a small bolt at the lower portion of the front as in Fig. II. and drawing it out about ⅛ inch, when the camera body may be lifted from its cover or box in the manner shown in Fig. III. At either side will now be found two arms, which are intended to hold the spools; these are swung outwards and the spool dropped into place, Fig. IV. The style in which the film is wound is akin to the method of wrapping fancy ribbons, that is, the ribbon and a strip of paper are wound together. Beyond the ends of the film will be found a certain length of opaque paper, this is undone and passed round the back of the camera at the focal plane and inserted in a slit on the bobbin at the other side. The camera can now be put in its cover or case and the small bolt closed. The key on top of camera should be turned about eighteen times when the Fig. I. will be seen through a piece of ruby celluloid at the back. This denotes that the film is at the focal plane ready for exposure. Each exposure is wound off in a similar manner until the number is seen at the back.

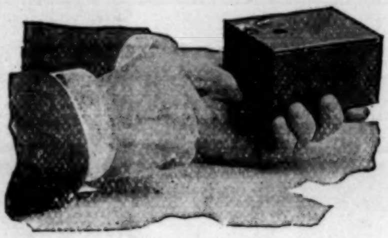


Fig. II.

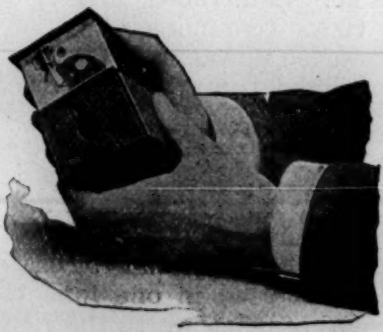


Fig. III.

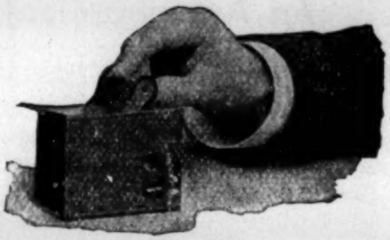


Fig. IV.

The method of setting and liberating the shutter for either instantaneous or time exposures, is controlled in a very ingenious manner by one small button. The shutter is set by pushing it to the left, whence it returns to its normal position by a spring, and is liberated by a slight pressure of the thumb as in Fig. V. For time exposures it is requisite to give the button a quarter turn before setting the shutter. A finder is provided, and the instrument is covered in morocco and all objects at and beyond four feet are in focus.

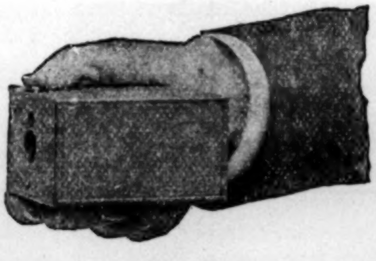
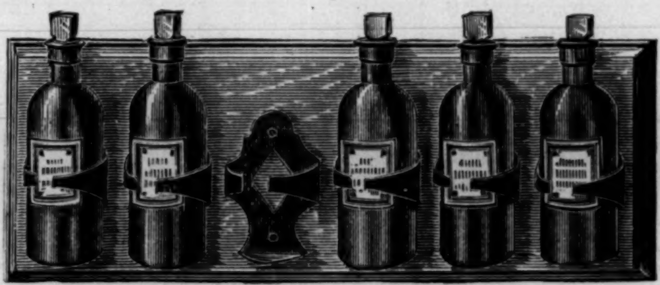
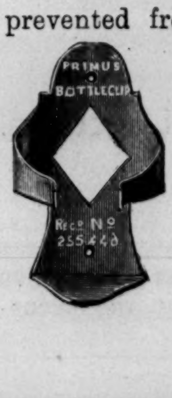


Fig. V.

BOTTLE CLIP.

Developing or other bottles can, by means of the new clip introduced by Messrs. Butcher be prevented from being knocked over in the dark, on board ship, or other places. The clips are nailed to any suitable wall or board, and when inserting a bottle in the clip it has only to be set on the ledge and pushed back, when the flexible steel arms will embrace it and hold it securely.

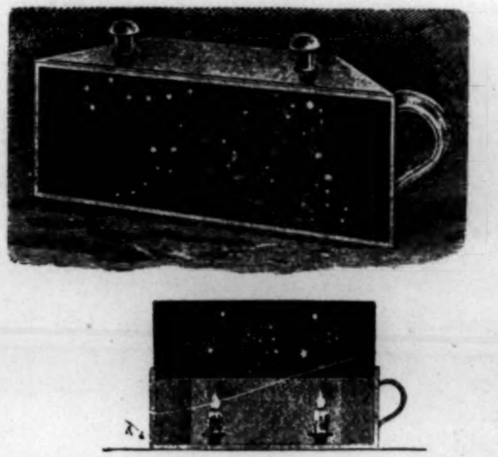




An Astronomical Lantern.

When one speaks of the lantern for use in class-rooms, it is generally understood that in this case an elaborate optical or magic lantern is implied, but from particulars given in the *Scientific American*, it will be seen that an efficient instrument for certain purposes can be constructed at little cost, yet will be very effectual for demonstrating to a small class.

The paper explains that: With the simple form of lantern shown in the illustration, and easily made small maps or charts of the star groups, a great deal of instruction and entertainment may be realised.



The lantern body may be of tin or wood, with flues to afford the necessary ventilation, and in one side has slideways, to facilitate the placing of the diminutive star charts in position in the side of the lantern. The lantern may be readily carried in the hand, and an illuminated chart thus representing any particular group of stars in the heavens greatly facilitates the finding of the group, furnishing most interesting and very simple star lessons.

For the charts or maps, a simple blue print is found quite sufficient, where regularly prepared slides are not obtainable, and such prints may be made from originals prepared by the observer, or copied from any of the numerous publications in which star maps are given.

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The Decline of Lantern Lectures.

By The Showman.

It has lately been stated that lantern lectures have declined in popular estimation; that this is to a great extent true, those who are accustomed to attend them, are able to testify. Although the modern lecture may or may not be as good as the lecture of days gone by, there is no doubt that the modern exhibition accompanying the lecture is generally vastly inferior to the exhibition of years ago. Things belonging to the past are often surrounded with a halo of glory by the rising generation, who wag their heads at each other and talk in regretful accents of the "good old days," days about which, after all, there is no advantage except that they are past and done with; but with the lantern exhibition of a certain period in the past, the case is different.

I propose to sum up a few of the causes which have led to the lantern at this end of the century being in such evil case, but in so doing, do not wish to cast aspersion on the efforts of those who have placed this instrument within the reach of the many. Looking back about five-and-forty years, we find very few lanterns made and sold commercially, and these few mostly oil-lit instruments, intended for use chiefly in the family circle. Photography, at that time, being little more than a curiosity, the slides used with such lanterns were cheap hand paintings, mostly of the "comic" order. I have written "cheap," I should have written "cheap for the times," as these slides sometimes turn up nowadays at sales of antiquated household effects, and are often found marked in plain figures at prices which would make the modern lanternist's hair stand on end.

At this time there were few travelling exhibitors, and as there was no standard size of slide, each man had his apparatus made, and views painted to order, adopting that size of slide and method of working which he considered most suitable. Sometimes, instead of single pictures, the views were merged into each other on panoramic slides upwards of two feet in length, which, exhibited through the screen, produced an effect very similar to the modern canvas panorama. These exhibitors were few and far between, because their outfit necessarily represented considerable capital; in fact, they succeeded financially according as they possessed capital combined with energy and business ability. Limelight was used in one form or another, and, the venture being worth the risk, no expense was spared to make it a success.

Some years later the development of photography brought about the introduction of photographic slides of the present standard size, and the old exhibitors soon found themselves competing with a host of others who exhibited the less expensive photo slides with smaller and consequently less expensive lanterns. To them the blow was a severe one, the more so as exhibitions having become more common were less sought after by the public, but still the competition that arose came mostly from professionals, as amateurs in those days rarely attempted the limelight. This was not the end by any means, for there soon followed the system of hiring not only slides, but lanterns and all accessories, which brought amateurs more especially into competition with professionals. The hire-system rapidly spread and nothing stood in the amateur's way except the management of limelight, making oxygen, etc., as it was not absolutely necessary to purchase any part of the apparatus. By this time the old exhibitors with expensive hand paintings had dropped off one after another, some of those who remained to the last getting stranded and sold up in distant provincial towns. And all the while receipts had been decreasing, partly because exhibitions, being more frequent, were becoming less attractive, and partly because exhibitors, finding their profits reduced, were becoming disheartened and careless.

I pass over the ever-cheapening production of photographic slides, competed with in their turn by chromo-lithographs, and hasten to record the final blow which fell a few years ago—the introduction of compressed gas. I suppose at the present time there is no village in England, however small, which does not get a lantern exhibition of some sort at least once a season, and seeing how the public regard the average exhibition, is it any wonder that high-class exhibitions are only attempted by the very few? So far, I have referred to the exhibition only, and have shown that altered conditions of production have increased the number of exhibitions out of proportion to the increase of population, and in so doing have shown the decrease in attractiveness of nearly all.

With the lectures also much fault may be found. Here again the amateur is mostly to blame. Working up a lecture independently of any trade set of slides is practically unheard of: generally, nothing beyond the printed lecture is attempted, and this, without any previous acquaintance with the text. Now and again, someone, either more rash or stupid than his fellows, undertakes to "work the lecture up a bit," and it always turns out that the lecture takes place at the time of year when he has the least leisure. So he arrives about two minutes before the time, almost breathless, and informs his colleague that he has "really had no time for preparation," and "must read them some extracts." Then, in the middle of the lecture, he stops short and says, "Now I will read you the—something or other—from so and so—by what's his name," and an interval of silence follows while he finds the place. The decline of lantern lectures is in no degree owing to the increase of literature and the existence of free and other libraries, as a good lecturer will give his audience the cream of any particular book in a single lecture, and with better and more numerous illustrations than the book itself; a more complete comprehension of the subject being in that way obtained, just as in the same way we get a better idea from seeing a Shakespearian play well performed on the stage, than we do from the efforts of the mere reader or reciter.

The public also has much to answer for, as a large section of it is extremely undiscerning, and looks upon every evening function at which a lantern is employed as a lantern lecture, apparently being quite unable to distinguish between a lantern lecture, a lecture illustrated by lantern views, a variety entertainment "turn," an exhibition of diapositives at a photographic society, a mission or other service at which the lantern is employed, or a show provided for the delectation of some Band of Hope children. None of these are in any sense lantern lectures, least of all, perhaps, a photographer's show, as this is not intended to be anything beyond an exhibition of the work of members or outsiders, the slides often being exhibited without any connecting remarks, or, if so, only those having to do with the technique of photography.

Another mistake often made is that of attempting to teach too much with the aid of the lantern. If we examine the prospectuses of lecture societies, we often find that there is among the more educational ones, only one lecture on a certain subject per season, and how much can be learnt in an hour and-a-half? To teach a subject or science with any completeness, at least six lectures are necessary, taking place at intervals of not more than a week, and even then it is best to have some standard authors to read up from and refer to at home.

I have endeavoured in the foregoing article to point out some of the causes which have led to a state of things which all true lanternists must deplore, the cure for which must be found in individual effort rather than in combined action; and though those who endeavour henceforth to leave, as far as lantern work is concerned, "footprints on the sands of time," may find their reward come but slowly, it will come none the less surely; and if I have been the unworthy means of inducing any to mount the ladder of fame, I shall consider that my efforts in this direction have been well bestowed.

Editorial Table.

PHOTOGRAPHY ANNUAL, 1895.—As mentioned in our last issue, this ponderous volume came to hand as we were going to press. It contains altogether some 866 pages, part of which is devoted to good original articles, part to tables and descriptions of apparatus, and part to advertisements. As usual, it is under the editorship of Henry Sturmey, and is sold at 2s. 6d. Those who have not yet got a copy should get one.

Correspondence.

BAGS *v.* CYLINDERS.

To the Editor.

SIR,—Replying to Mr. Taunt, allow me to say that the information I gave on the subject of retort safety valves, was based on my own experience. I use an old mercury bottle, laid horizontally on a powerful gas stove, and powdered chlorate and manganese, only in the proportion of five to one, and though the gas always comes off rapidly, have never been able to get a greater accumulation in the delivery tube than would fill a tea spoon. At one time I used a certain quantity of powdered salt, but after awhile gave it up and found little difference, so that Mr. Lewis Wright's statement that powdered chlorate without salt will cause violent rushes is incorrect under the conditions named above. My retort was originally fitted with a cork valve, which on more than one occasion ignited spontaneously, and after burning sufficiently loose, blew out, so I had the hole plugged up permanently. In the case Mr. Taunt alludes to, the delivery tube may not have been washed out after using on the previous occasion, or the retort may have been too small for the charge. I am at a loss to know quite what is meant by a "sad accident" in this connection, but if Mr. Taunt can quote an authentic case of a person being killed or injured by the bursting of a retort from over-pressure due to the choking of the delivery pipe, I shall be glad to hear of it. The article in question was not intended as a complete statement of the case for and against either bags or cylinders, but I quite agree that the majority of lanternists will use cylinders, which after all proves nothing, as the majority of lanternists are amateurs to to whom ease in obtaining a light is of paramount importance, screen results being quite a secondary consideration.

Yours truly,

THE WRITER OF THE ARTICLE.

Notes and Queries.

I. C. White.—The apparatus answers well. Send us a stamped letter addressed to writer of the article, and we will forward it.

Lens.—Measure the distance from a point midway between the lenses to a surface on which a distant image is sharply depicted.

H. Banks.—You are mistaken in saying that cylinders can now be taken by the London and South Western Railway to Jersey. We have been in communication with every railway in Great Britain, and have received particulars from same. In the report that you mention you will find the small word "not"; perhaps you have overlooked this.

Vandervere writes:—I have seen it mentioned that by some process of artificial lighting, it is now possible to make photographs of the bottom of the ocean. Can you tell me how this is done, also where I could purchase or hire a set of lantern slides of some of the best examples? *Ans.*—We, too, have heard of it; and the explanation is as follows:—"The apparatus consisted essentially of a barrel filled with oxygen, surmounted by a glass bell containing an alcohol lamp. By the aid of a mechanical contrivance, powdered magnesium is thrown on the flame of the lamp, which flares, allowing a view to be taken. The equilibrium of the barrel is preserved by means of suitable vents in the bottom, which admit water as the oxygen diminishes." We have neither seen the pictures, nor can we tell you where you can get the slides. We should say you cannot get them, at least, at present.

Thos. H. Yardley.—1. See reply to "Lens." 2. The Hon. Secretary of the Lantern Society is Mr. W. Bashall, 21, Holland Villas Road, W. 3. The paper you speak of died some time ago.

G. F. Ashley.—Your question about the particular condenser would have taken too much space in this column, so we have dealt with the subject somewhat fully on another page. We have in type an article dealing with stage illumination, giving illustrations of how one person can control all the necessary lighting. This will appear in our next.

Fredk. Andrews.—We should advise you to discard the use of soft limes altogether, as you will find the hard ones preferable, no matter whether you use a spirit, blow-through, mixed jet, or saturator. In a short time we anticipate that only the hard variety will be dealt in, as hitherto there has been a good deal of imagination as to soft limes being better suited with certain jets.

Thos. Bryne writes:—Is it true that if a pinch of magnesium is put into the oil reservoir of a lantern oil lamp, it will increase the luminosity of same? *Ans.*—This is a matter upon which you could have experimented yourself, but you will find that the addition of a little pepper or mustard will give the same increase as the powder spoken of, *i.e.*, nil.

R. B. M.—If you will examine any lantern, you will find that the condenser is fastened to the nozzle of front; consequently, when the front is deflected, the optical axis of the lens and condenser is not interfered with.

W. H. Mathieson (New Zealand).—(1) It would hardly be fair for us to institute comparison between the goods of same style by different makers, but up to the present you can rely on any of the saturators which have been described editorially in our columns. (2) The candle-power mentioned is at present considered good for the apparatus. Some makers may have a tendency to "go one better than their neighbours," but we happened to test this particular light. (3) If you refer to the home slides advertised in March Journal, they were disposed of within a couple of days. Will try and put you in communication with someone having such slides.

A. S.—(1) About six inch focus. (2) Six or eight feet. (3) Opaque. (4) Archer or Tomkinson, of Liverpool. The address of the former will be found in all our issues, that of the latter some few months back.

Rev. Young (Georgia, U.S.A.)—In our next.